

Review for Polynomials Test

Date _____ Period _____

Divide.

1) $(m^3 - 9m^2 - 13m + 31) \div (m - 10)$

2) $(x^3 - 8x^2 - 3x + 2) \div (x - 1)$

3) $(3b^4 - 36b^2 + 21b + 26) \div (3b - 9)$

4) $(2x^3 - 22x^2 + 48x + 50) \div (x - 7)$

Factor each completely.

5) $6n^3 + 12n^2 + 5n + 10$

6) $7x^3 - 4x^2 - 7x + 4$

7) $27x^3 - 125$

8) $648x^3 - 375$

Factor each.

9) $x^2 - 2x - 3 = 0$

10) $x^3 - 8 = 0$

11) $x^4 - 3x^2 - 10 = 0$

12) $x^4 - 125x = 0$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

13) $-4, -2 + \sqrt{5}, -2 - \sqrt{5}$

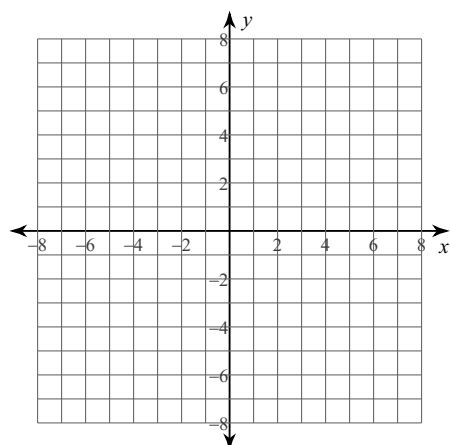
14) $-1, \sqrt{7}, -\sqrt{7}, i, -i$

15) $\frac{5}{4}, 4, \frac{3}{2}$

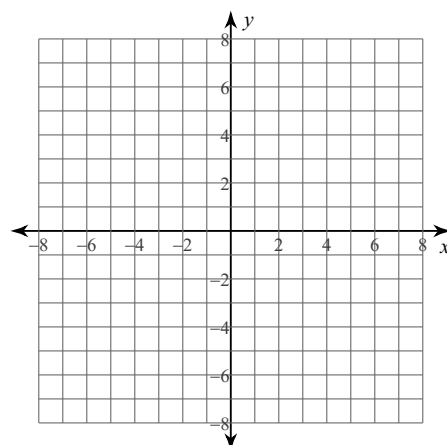
16) $-5, -1, 3$

Sketch the graph of each function. State the number of real zeros. Approximate each zero to the nearest tenth. Approximate the relative minima and relative maxima to the nearest tenth.

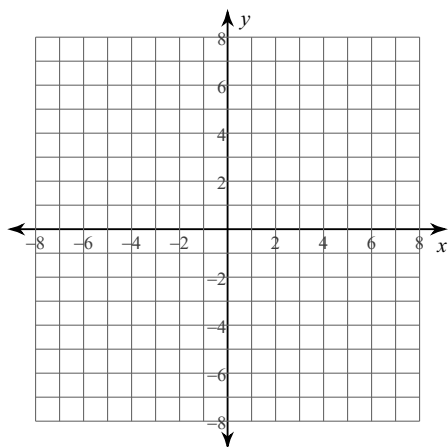
17) $f(x) = -x^3 + 8x^2 - 20x + 12$



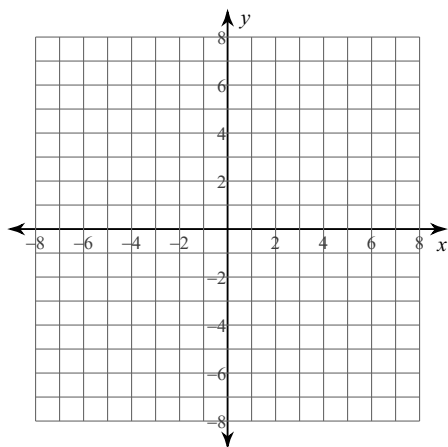
18) $f(x) = -x^4 + 4x^2 - 2x - 2$



19) $f(x) = -x^4 + x^2 + x + 4$



20) $f(x) = -x^3 - 5x^2 - 3x + 7$



Describe the end behavior of each function.

21) $f(x) = -x^4 + x^2 - 4$

22) $f(x) = x^2 + 4x + 5$

23) $f(x) = x^5 - 2x^3 + x + 1$

24) $f(x) = -2x^2 - 16x - 32$

State the possible rational zeros for each function. Then factor each and find all zeros.

25) $f(x) = 2x^3 + 5x^2 + 4x + 10$

26) $f(x) = 3x^3 + 3x^2 - 4x - 4$

Answers to Review for Polynomials Test (ID: 1)

1) $m^2 + m - 3 + \frac{1}{m-10}$

2) $x^2 - 7x - 10 - \frac{8}{x-1}$

3) $b^3 + 3b^2 - 3b - 2 + \frac{8}{3b-9}$

4) $2x^2 - 8x - 8 - \frac{6}{x-7}$

5) $(6n^2 + 5)(n + 2)$

6) $(x-1)(x+1)(7x-4)$

7) $(3x-5)(9x^2 + 15x + 25)$

8) $3(6x-5)(36x^2 + 30x + 25)$

9) $(x-3)(x+1) = 0$

10) $(x-2)(x^2 + 2x + 4) = 0$

11) $(x^2 + 2)(x^2 - 5) = 0$

12) $x(x-5)(x^2 + 5x + 25) = 0$

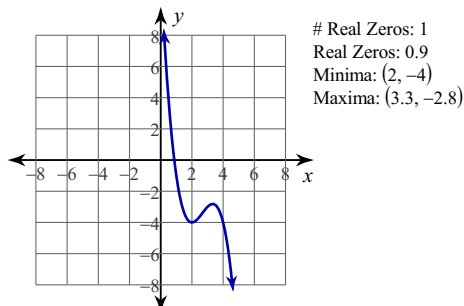
13) $f(x) = x^3 + 8x^2 + 15x - 4$

14) $f(x) = x^5 + x^4 - 6x^3 - 6x^2 - 7x - 7$

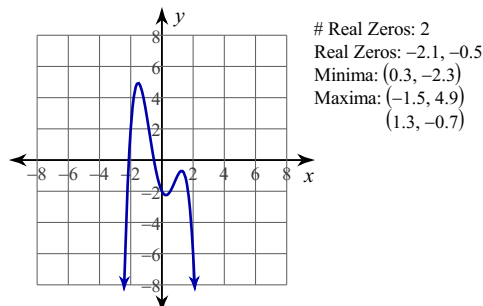
15) $f(x) = 8x^3 - 54x^2 + 103x - 60$

16) $f(x) = x^3 + 3x^2 - 13x - 15$

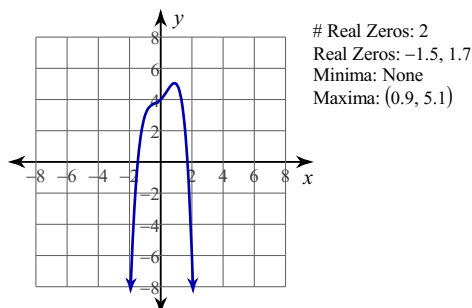
17)



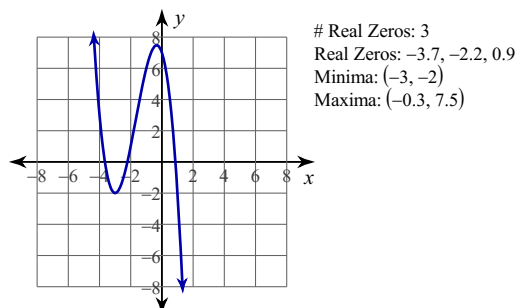
18)



19)



20)



21) $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$

$f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$

24) $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$

$f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$

22) $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$

$f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$

25) Possible rational zeros:

$$\pm 1, \pm 2, \pm 5, \pm 10, \pm \frac{1}{2}, \pm \frac{5}{2}$$

Factors to: $f(x) = (2x+5)(x^2+2)$

Zeros: $\left\{-\frac{5}{2}, i\sqrt{2}, -i\sqrt{2}\right\}$

23) $f(x) \rightarrow -\infty$ as $x \rightarrow -\infty$

$f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$

26) Possible rational zeros:

$$\pm 1, \pm 2, \pm 4, \pm \frac{1}{3}, \pm \frac{2}{3}, \pm \frac{4}{3}$$

Factors to: $f(x) = (x+1)(3x^2-4)$

Zeros: $\left\{-1, \frac{2\sqrt{3}}{3}, -\frac{2\sqrt{3}}{3}\right\}$